



KPO TECHNICAL WEBINAR ON DRIVES WITH THE PARTICIPATION OF THE IMB CENTER

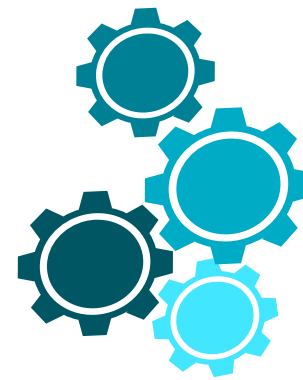
KARACHAGANAK PETROLEUM OPERATING B.V

28/03/2025

DISCLAIMER

The information contained in these slides is made available for consideration. It represents KPO's preliminary description of the company's demands as presently envisaged, but KPO reserves the right to change this information in the course of planning and implementing the projects, and KPO cannot be held responsible for any loss, damage or expense arising from reliance on this information. The information will not form part of any agreement between KPO and contractors participating in the workshop.

Today's engagement is one of many steps which KPO and its stakeholders are taking to develop local content.



Electric drives and components

PRESENTATION CONTENT

1. Introduction.
2. Types of electric motors used in KPO
3. Technical requirements to electric motors
 - Degree of ingress protection (IP), in accordance with IEC 60529
 - Requirements to the international standards IEC 60079
 - Ambient temperature requirements
 - Noise level requirements in accordance with ISO 1680
 - Electrical insulation requirements in accordance with IEC 60034-18.
4. Electric motors maintenance execution strategy in KPO.
5. Technical requirements to bearings in KPO B.V. Requirements to the ball bearings in accordance with ISO R281.
6. Most commonly used bearings in electric motors at KPO B.V.

INTRODUCTION

The purpose of this presentation is to familiarize participants with the technical requirements for electric motors used at KPO: OEMs, as well as specifications and forecasted demand for critical components, such as bearings.

The presentation is aimed at:

- Clarification of the technical requirements for electric motors used at KPO, based on applicable standards and the document “Specification for Low Voltage Induction Motors – KPO-00-ELT-SPC-00016-ER”;
- Providing information on the most commonly used bearings in electric motors, including their specifications and consumption.

TYPES OF ELECTRIC MOTORS USED AT KPO

At KPO production sites, over 2,200 low-voltage (400V/690V) electric motors with a power rating of up to 315 kW are in operation, along with 51 ea. 6kV electric motors.

These include OEMs such as:

- ABB
- ATB
- Brook Hansen
- Brook Crompton
- CEMP
- Euromotori
- HEW
- INGERSOLL-RAND
- LOHER
- MARELLI MOTORI
- ROTOR
- SUD ELECTRIK AG
- WEG

TECHNICAL REQUIREMENTS TO ELECTRIC MOTORS

- **Degree of ingress protection (IP), in accordance with IEC 60529** (Degrees of protection provided by enclosures):
 - The minimum enclosure protection rating must be IP55.
 - Applied in Kazakhstan and EAEU countries through GOST 14254-2015, which is its equivalent.

- **Requirements to the international standards IEC 60079:**
 - If the technical documentation states that the motor is intended for use in hazardous area, the motor and all of its components must comply with the requirements of the approved certification body and must bear nameplates and markings in accordance with the relevant sections of IEC 60079.

 - *IEC 60079 is an international standard that sets requirements for electrical equipment used in explosive atmospheres (oil, gas, chemical industries). It includes zone classification, protection methods (Ex d, Ex e, Ex i, Ex p, etc.), and requirements for the installation, operation, and maintenance of Ex equipment. In Kazakhstan, IEC 60079 is applied through GOST 60079 and TR CU 012/2011 "On the safety of equipment intended for use in explosive atmospheres". The supply of equipment for use in Ex zones is subject to mandatory certification under ATEX (ATEX 2014/34/EU) or GOST/TR CU.*

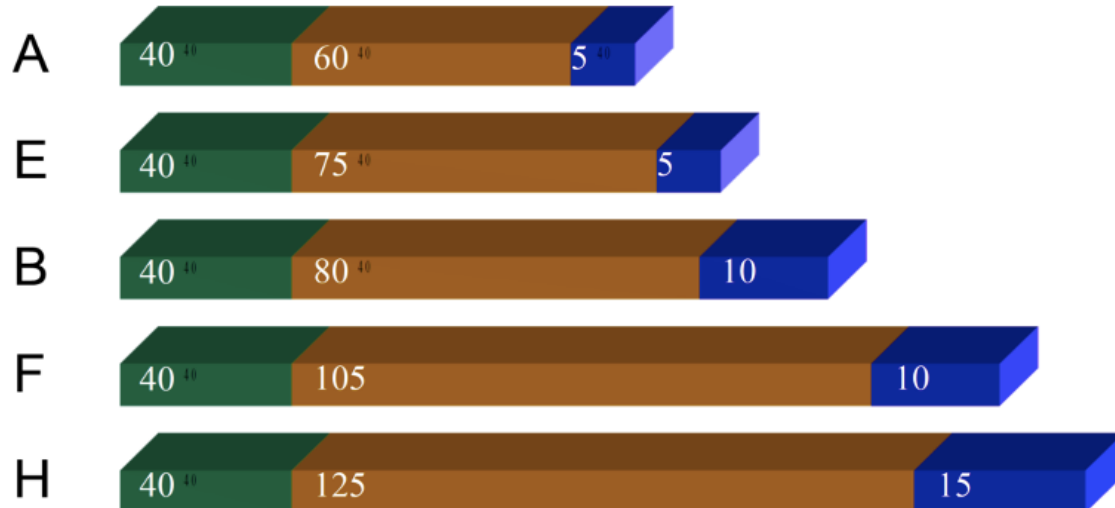
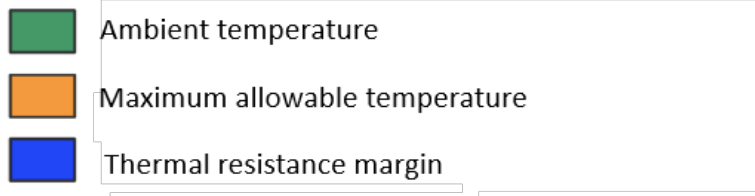
➤ **Ambient temperature:**

- According to the document - Specification for Low Voltage Induction Motors (KPO-00-ELT-SPC-00016-R), the motors must be designed to operate at ambient temperatures from **-40C to +40C**.

➤ **ISO Noise level requirements in accordance with ISO 1680** (Acoustics. Test code for the measurement of airborne noise emitted by rotating electrical machines):

- It regulates test conditions, sound pressure measurement methods, and procedures for evaluating acoustic performance.
- The maximum noise level must not exceed 77 dB.

- **Electrical insulation requirements in accordance with IEC 60034-18 – Rotating electrical machines.**
Guidelines for evaluation of electrical insulation.
 - All insulating materials must be at least Class F, as specified in IEC 60034-18



Maintenance of electric motors is carried out in accordance with strategy KPO-AL-MAI-GTS-00014-ER, which prescribes a maintenance interval of once every 48 months. As part of the maintenance, replacement of bearings is performed, the integrity and compliance of the EX enclosure with IEC 60079 standards is verified, and electrical parameter diagnostics are carried out at the KPO Workshop.

If non-compliance with technical requirements is identified, the electric motor is sent for overhaul to a specialized Workshop of Business partner. If restoration is not possible, a new electric motor with identical technical specifications is procured.

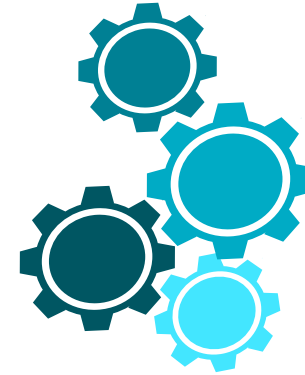
Requirements to the ball bearings in accordance with ISO R281R281 (Ball bearings. Dynamic load rating and rated service life):

- Rolling bearings must be of type C3 .
- Bearings must have B10 service life of at least 40,000 hours, calculated in accordance with ISO R281.
- ISO 281 is an international standard that specifies methods of calculating the rated service life of rolling bearings based on dynamic loading and operating conditions. It defines the B10 (L10) service life, at which at least 90% of the bearings in a batch are expected to remain operational, taking into account factors such as lubrication, temperature, and contamination. .

CONSUMPTION FORECAST

Demand forecast for the most commonly used bearings in maintenance operations:

MODEL	2025-2026 (quantity, ea.)
6203 ZZ C3	110
6204 ZZ C3	88
6206 ZZ C3	70
6208 ZZ C3	36
6212 ZZ C3	40
6213 ZZ C3	20
6306 ZZ C3	44
6308 ZZ C3	120
6309 ZZ C3	84
6310 ZZ C3	44
6311 ZZ C3	22
6312 C3	150
6313 C3	38
6319 C3	20



Maintenance & Spare Parts Strategy

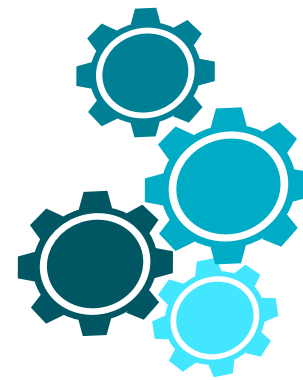
1. Summary
2. Gas Turbines - Maintenance activities
3. Steam Turbines - Maintenance activities
4. Diesel Engines – Maintenance activities
5. Gear Boxes – Maintenance activities

CONTENT SUMMARY

Maintenance & Spare Parts Strategy:

- Overview of strategies and alignment with local content requirements.
- Equipment Overviews & Maintenance
 - Gas Turbines (MS5002D, PG6561B)
 - Steam Turbines (353T, 503E)
 - Diesel Engines
 - Gearboxes (Flender, MAAG, Voith)

Each section includes general overviews and maintenance activities.



1

KPO Gas Turbines Overview

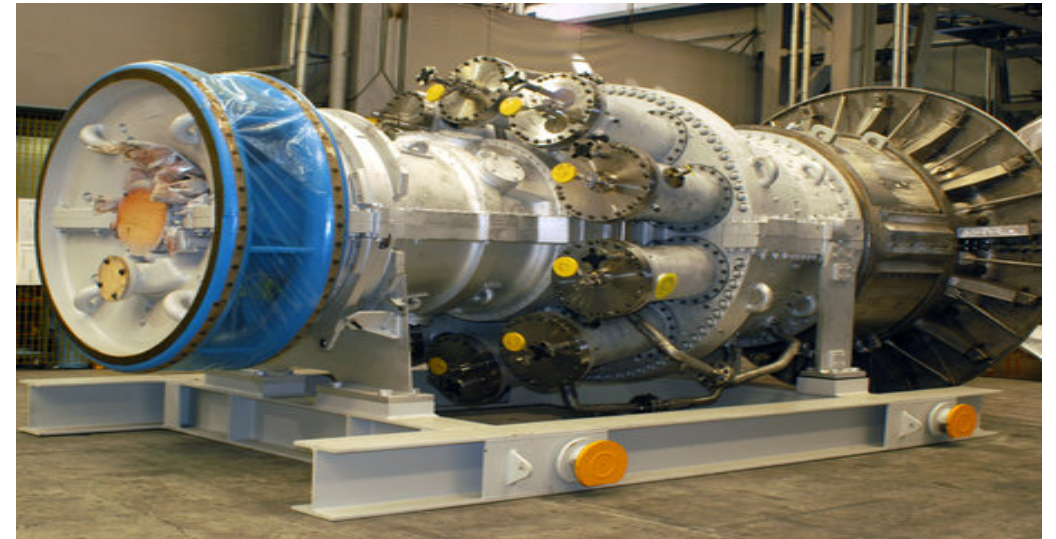
GAS TURBINE OVERVIEW

OEM	Type	Power Range
General Electric (x5)	MS5002D dual shaft*	32.5MW
General Electric (x4)	PG6561B single shaft*	36.3MW

G .T. MS5002D



G .T. PG6561B

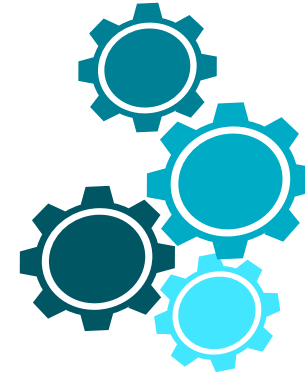


MAINTENANCE ACTIVITIES ON THE GAS TURBINE MS5002D

Activities	Periodicity	Used Spares
LTPI Liner & Transition pieces inspections	24 k HRS Will be combined with HGPI	Cap & Liner Transition Pieces Primary Burners Secondary Burners Cross Fire Tubes Consumables
HGPI Hot Gas Inspections	32 k HRS	LTPI spares* + 1st Stage Nozzle Set 1st Stage Bucket 1st Stage Cover Plate Set 1st Stage Shroud Set Consumables
Major Over Haul	64 kHRS	HGPI spares* + 1 st &2 nd Stage Nozzle Set 1 st &2 nd Stage Bucket 1 st &2 nd Stage Cover Plate Set 1 st &2 nd Stage Shroud Set Consumables

MAINTENANCE ACTIVITIES ON THE GAS TURBINE PG6561B

Activities	Periodicity	Used Spares
Combustion Inspection	12k HRS will be moved 24k HRS	Cap & Liner Transition Pieces Primary Burners Secondary Burners Cross Fire Tubes Consumables
Major Over Haul	48 k HRS	Combustion Insp spares* + 1 st &2 nd &3 rd Stage Nozzle Set 1 st &2 nd &3 rd Stage Bucket 1 st &2 nd &3 rd Cover Plate Set 1 st &2 nd &3 rd Stage Shroud Set Consumables



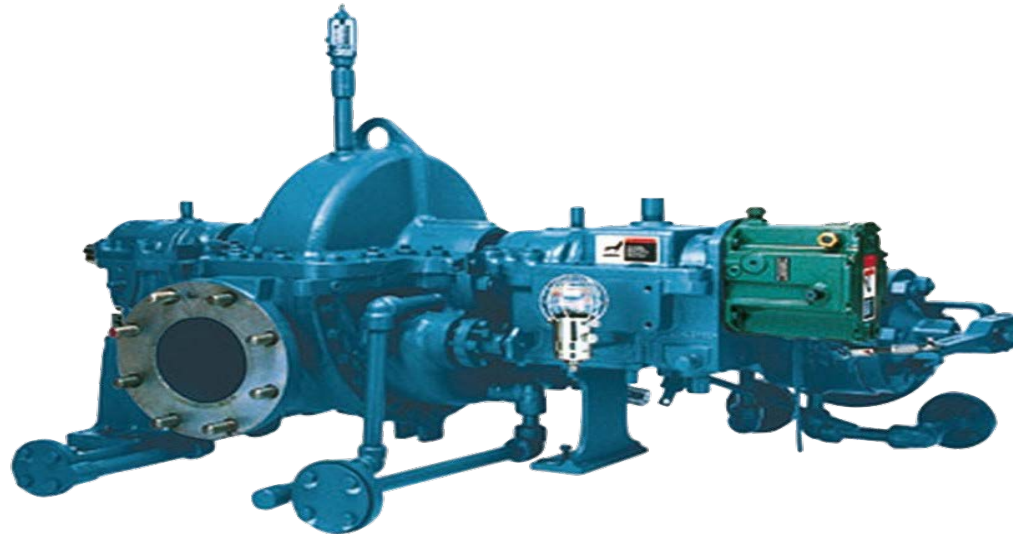
2

KPO Steam Turbines Overview

STEAM TURBINES OVERVIEW

OEM	Type	Power Range
Dresser Rand (x2)	353T	375 kW
Dresser Rand (x4)	503E	203 kW

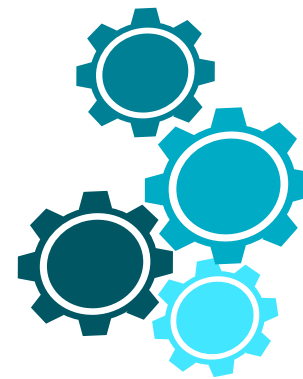
Steam Turbine



MAINTENANCE ACTIVITIES OF STEAM TURBINES TYPE 353T

Activities	Periodicity	Used Spares
Partial Inspection	1Y	Oil Oil filter
Major Overhaul	6Y	Rotor (Optional) Bearings Rings Valves Governor valve Bushing Stem Consumables

Activities	Periodicity	Used Spares
Partial Inspection	1Y	Oil
Major Overhaul	6Y	Rotor (Optional) Bearings Rings Valves Governor valve Bushing Stem Consumables



3

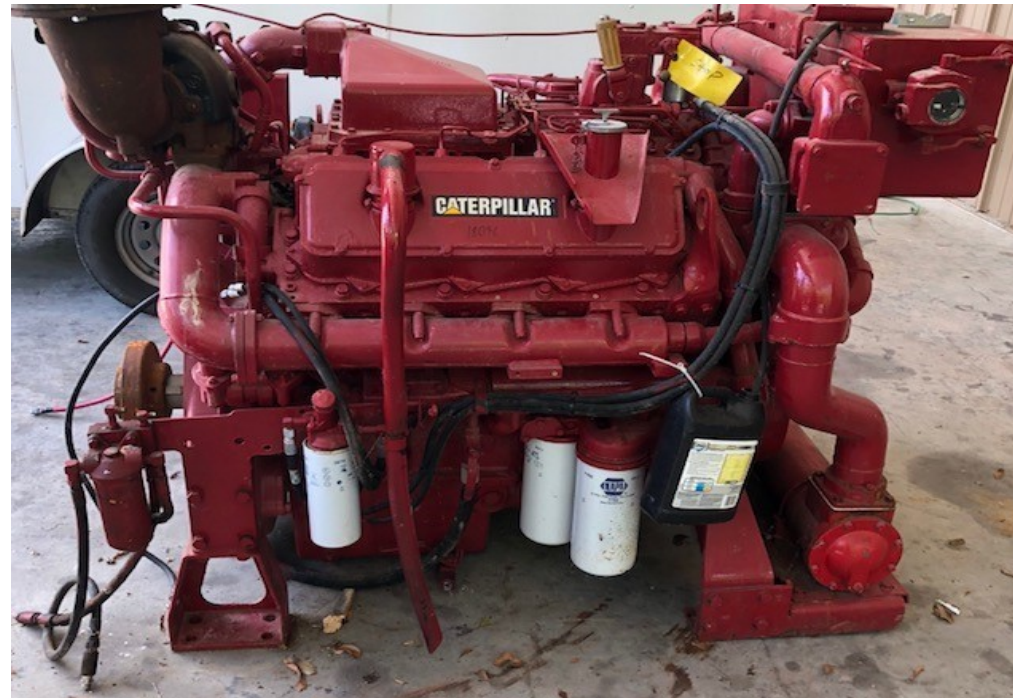
KPO Diesel Engines Overview

DIESEL ENGINES OVERVIEW

OEM	Type	Power Range
John Deere	4045HF158	112kW
Caterpillar (x5)	3408	377kW
Caterpillar	3516-TA-EPG	1710kW
Perkins	4012-46 TAG2A	1331kW
General Electric Co. (x2)	25Z06567	3028kW
General Electric Co.	GE 12 V 250 / VEE	3028kW
Patterson (x2)	3406B	314kW

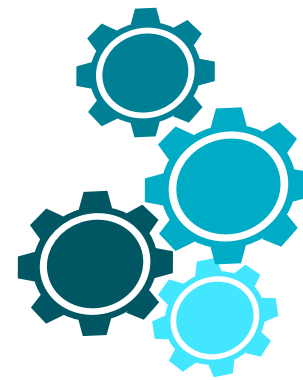
DIESEL ENGINE OVERVIEW

Diesel Engine: 3408



MAINTENANCE ACTIVITIES ON THE DIESEL ENGINES

Activities	Periodicity	Used Spares
Partial Inspection	6M	Air / Oil / Fuel filters
Full Overhaul	36M	Belt, Fuel pump, Radiator Cap, Rocker Cover gasket, O-ring, Seal ring, Injector gasket, Injector, Oil Cap



4

KPO Gears Boxes Overview

GEAR BOXES OVERVIEW

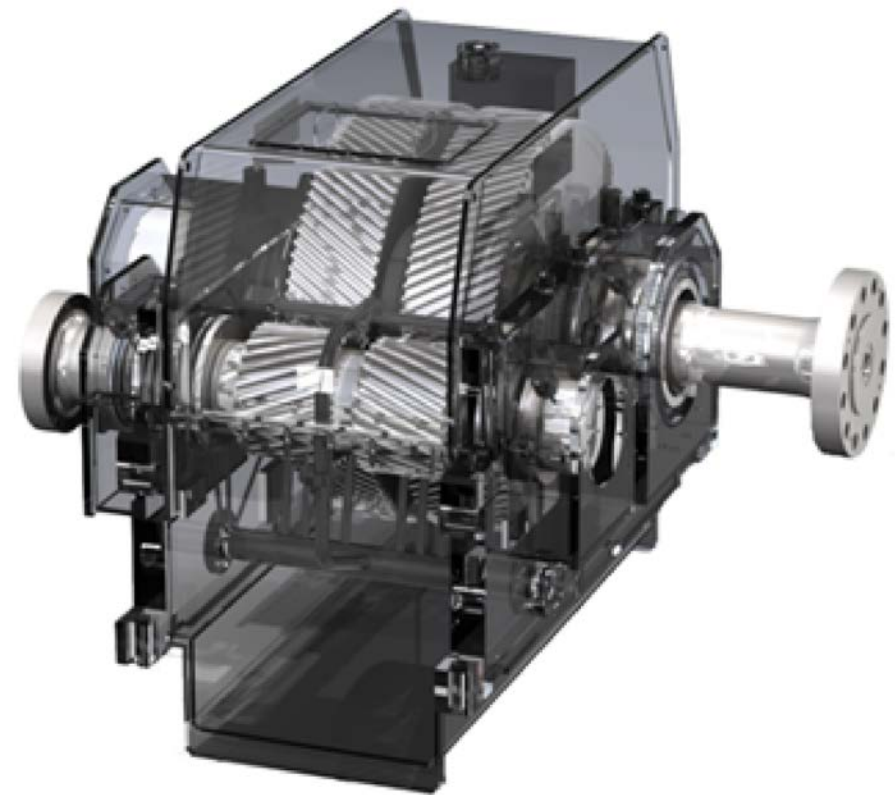
OEM	Type
Flender	TX32/5X
Flender (x2)	TX32/4X
Flender (x9)	TX80/9X
MAAG (x5)	GB-50/2
Flender (x5)	GF51BE
Voith (x4)	FLUIDRIVE-GST50
Voith (x4)	A609
Flender (x4)	TRL65CV

GEAR BOXES & FLUID OVERVIEW

Fluid Coupling GST 50



Gear Box TX80/9X



MAINTENANCE ACTIVITIES ON FLUID COUPLING (Voith:GST50)

Activities	Periodicity	Used Spares
Full Overhaul	48000 HRS	Shaft input (optional) Shaft output (optional) Geroter Gear Coupling Oil pump (optional) Consumables

MAINTENANCE ACTIVITIES ON OTHER GEAR BOXES

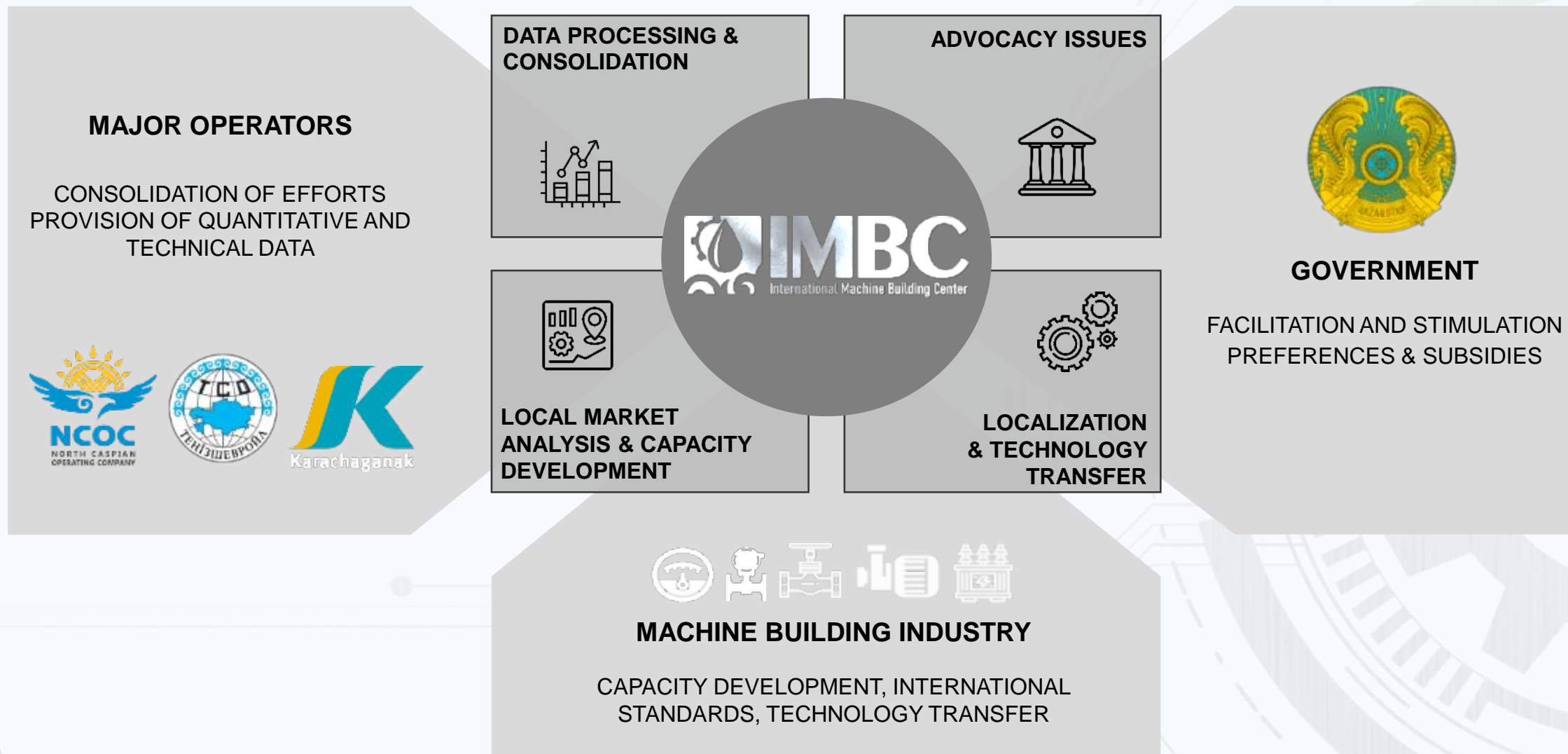
Activities	Periodicity	Used Spares
Full Overhaul	48000 HRS	Bearings Gear set (optional) Shaft coupling (optional) Oil pump Consumables



OVERVIEW OF IMB CENTER'S ACTIVITIES

KPO TECHNICAL WEBINAR ON DRIVES





In our analyses of demands and identifying localization priorities, we utilize the FPAL coding system

FPAL Commodity Codes

1.01
Drilling Equipment

1.02
Material and Product Handling Equipment

2.99
Other Products / Equipment and Materials

Commodity Group A

1.09
Electrical Equipment and Materials

1.10
Instrumentation / Process Control Equipment / Materials

2.02
Valves and Accessories

Commodity Group B

1.04
Pumps and Seals

1.11
Process Filters

1.12
HVAC

2.01
Line pipe

Commodity Group C

1.02
Material and Product Handling Equipment

1.07
Heat Exchangers / Heat Transfer Equipment

1.16
Firefighting Equipment

2.07
Chemical / Oils / Paints

2.08
Insulation / Refractory Materials

Commodity Group D

1.03
Compressors / Expanders / Blowers and Accessories

1.05
Drives and Accessories





2.03
Steel / Metal Materials

2.11
Workshop and Handtools

Procurement in above commodity groups accounts for **over 75% of all procurement of goods** by three Operators **

* According to the statistical data of Situational-analytical center of the Fuel and Energy complex of the Republic of Kazakhstan

PROGRESS UNDER COMMODITY GROUPS

	 Commodity Group A	 Commodity Group B	 Commodity Group C	 Commodity Group D
Demands analysis	35 000 items analysed	55 000 items analysed	7 000 items analysed	12 000 items analysed
High demand goods identified	22 types of goods	19 types of goods	27 types of goods	39 types of goods
Market analysis, longlist from available resources	more than 90 manufacturers identified	more than 100 manufacturers identified	more than 80 manufacturers identified	more than 150 manufacturers identified
Site surveys, manufacturers who expressed interest	81 site surveys conducted	73 site surveys conducted	50 site surveys conducted	55 site surveys conducted
Shortlisting, manufacturers producing types of goods with high demands	23 manufacturers shortlisted	16 manufacturers shortlisted	In process	TBC
Summarized Technical Requirements	12 STRs developed	8 STRs developed	In process	TBC
Capacity development	10 CDPs developed	4 CDPs developed	TBC	TBC
Implementation of capacity development	3 recommended manufacturers	2 recommended manufacturers	TBC	TBC
Localization Cases	13 LC cases developed with investors	5 LC cases developed with investors	4 LC cases developed with investors	1 LC cases developed with investors
Recommendations to Operators				

DRIVES & ACCESSORIES



Electric motors (1 phase, 3 phase, Induction Hazardous, etc.), Spares
1,857 ea/asy/kit



Gas turbine Spares, Accessories, Consumables (Repair kit, Dryer, Filters, Gaskets, Helicoil, Cap, Liner, etc.)
2,720 ea/asy/kit



Couplers
404 ea/kit



Gear Boxes, Spares, Accessories, Consumables (Shaft, Gear, Disk, circlip, etc.)
1,962 ea/kit/pac



infoimbc@imbc.kz



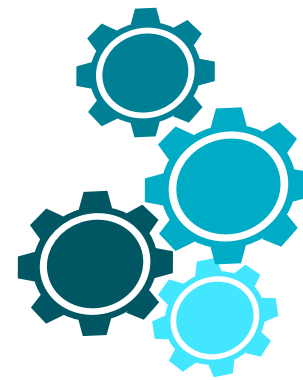
+ 7 (7172) 39-99-66



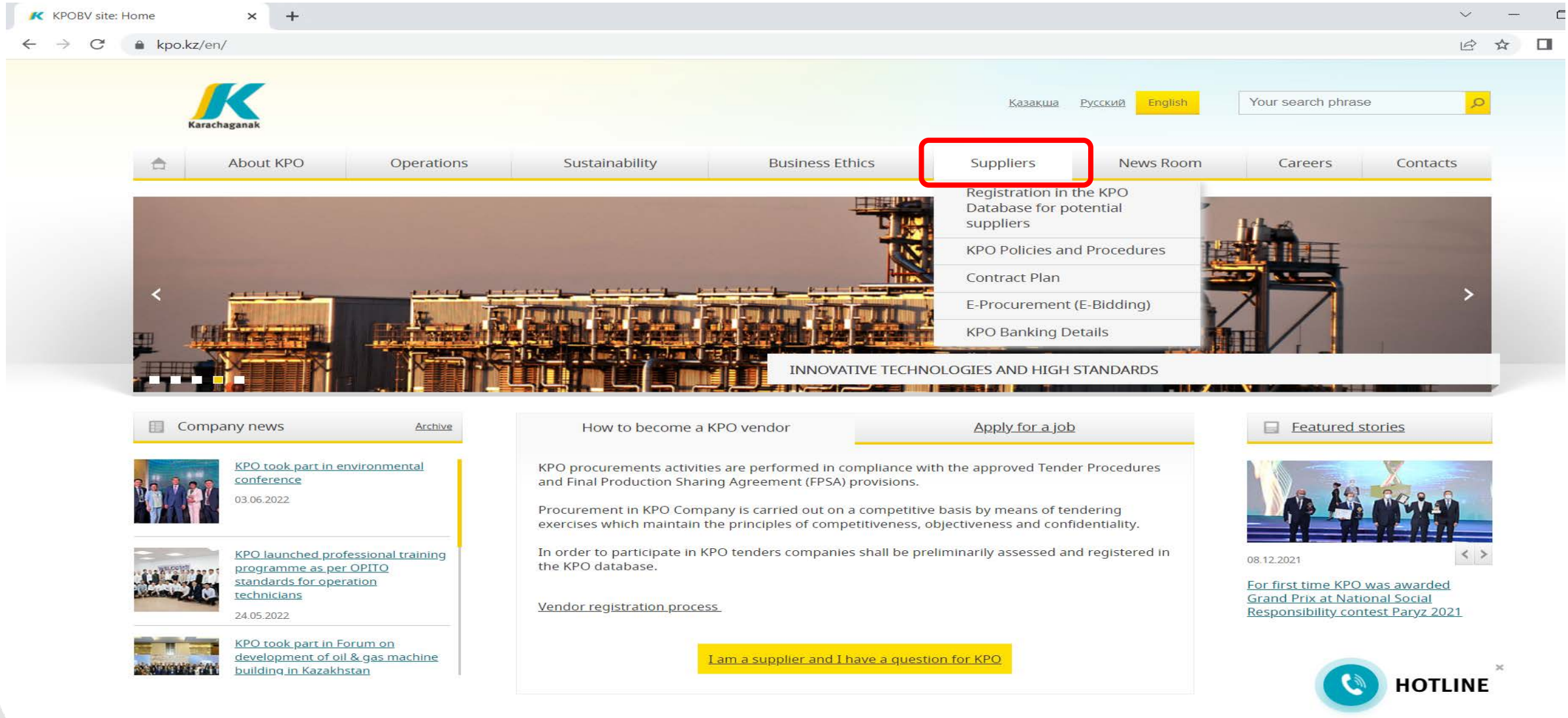
www.imbc.kz

The range and specificity of services for assistance in the development of the potential of manufacturers, offered by IMBC, are limited and are subject to provision on an individual basis, depending on the readiness of the manufacturer to supply their manufactured goods in line with the requirements of the Operators.

Assistance from IMBC does not oblige any retaliatory action from the potential manufacturer. The services of IMBC do not represent a guarantee of the successful participation and / or successful award of Contracts to the manufacturer in the procurement processes of the Operators.



**KPO Supplier
Database**



The screenshot displays the KPO website interface. At the top, there is a navigation bar with the Karachaganak logo, language options (Kazakh, Russian, English), a search bar, and a main menu. The 'Suppliers' menu item is highlighted with a red box, and its dropdown menu is visible, listing options: 'Registration in the KPO Database for potential suppliers', 'KPO Policies and Procedures', 'Contract Plan', 'E-Procurement (E-Bidding)', and 'KPO Banking Details'.

Below the navigation bar, there is a large banner image of an industrial facility with the text 'INNOVATIVE TECHNOLOGIES AND HIGH STANDARDS'.

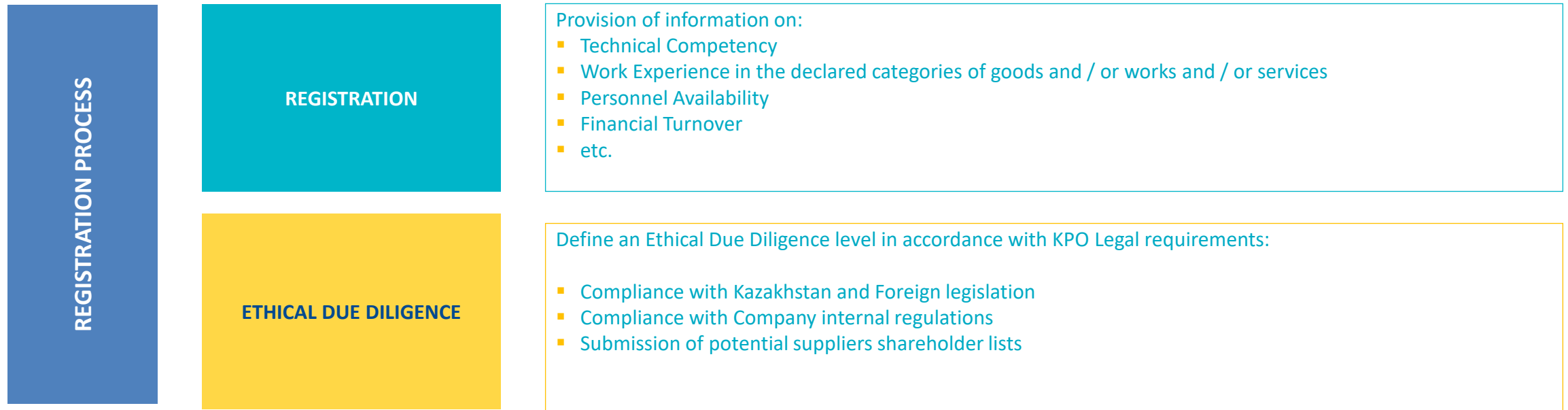
The main content area is divided into three columns:

- Company news**: A list of recent news items with dates and titles, including 'KPO took part in environmental conference' (03.06.2022), 'KPO launched professional training programme as per OPITO standards for operation technicians' (24.05.2022), and 'KPO took part in Forum on development of oil & gas machine building in Kazakhstan'.
- How to become a KPO vendor**: A section titled 'Apply for a job' containing text about procurement activities, tendering exercises, and the vendor registration process. A yellow button at the bottom reads 'I am a supplier and I have a question for KPO'.
- Featured stories**: A section titled 'Featured stories' featuring a photo of a group of people and the text 'For first time KPO was awarded Grand Prix at National Social Responsibility contest Paryz 2021' (08.12.2021).

In the bottom right corner, there is a 'HOTLINE' button with a phone icon.

VENDOR REGISTRATION

All potential suppliers shall be registered in KPO Database



Vendor registration in KPO Vendor Database does not guarantee the participation in a tender or contract award, but suggests that a registered company may be considered as a market research participant for provision of goods, works and services for further pre-qualification process or tender as the need arises.

VENDOR REGISTRATION

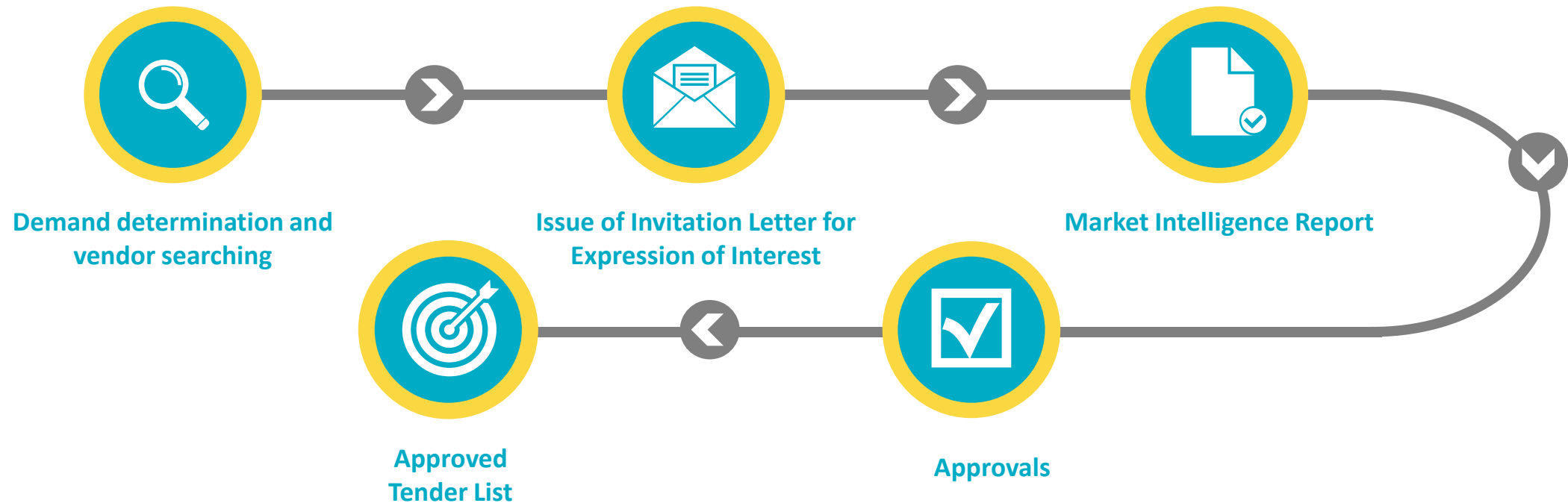
- To register in KPO Vendor Database, potential suppliers shall:
 - Download a questionnaire on KPO website – <https://kpo.kz/ru/postavshchikam/registracija-v-baze-dannykh-postavshchikov-kpo>
 - Fill in the questionnaire for the preliminary vendor assessment and indicate activity codes
 - Attach copies of required documents
 - Submit the completed pack of documents for vendor assessment and registration by e-mail at MIVQ@kpo.kz
 - Contact phone: +7 (711336) ext. 4943, 4946, 2192
- KPO encourages Suppliers to update registration data on an ongoing basis, related to:
 - Work Experience in the declared categories of goods, works, services
 - Certification, accreditation
 - Reorganization
 - Contact persons

MARKET RESEARCH

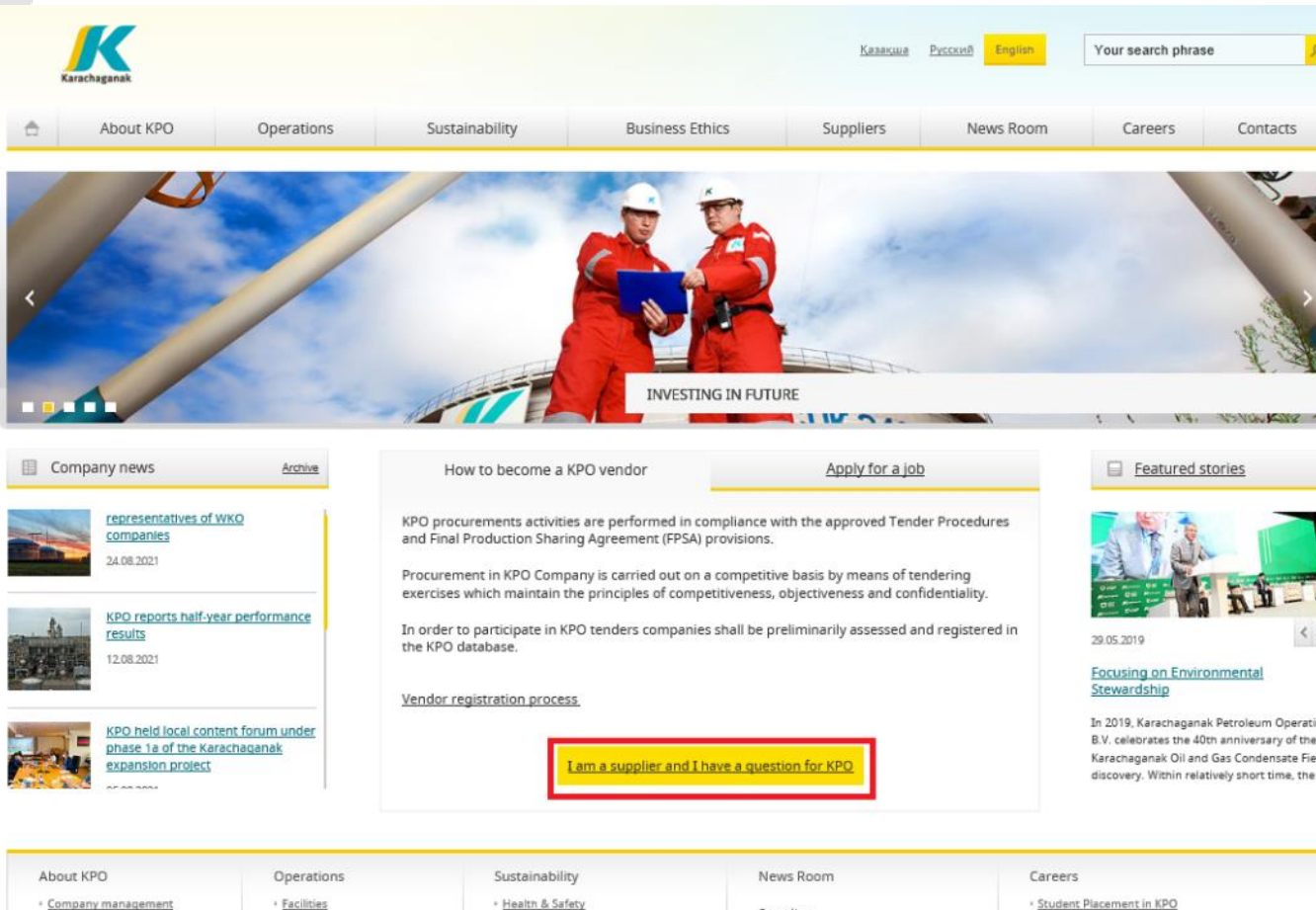
Purpose

- Define potential suppliers of goods, works, services who can perform as per KPO requirements
- Ensure free competition for KPO tenders

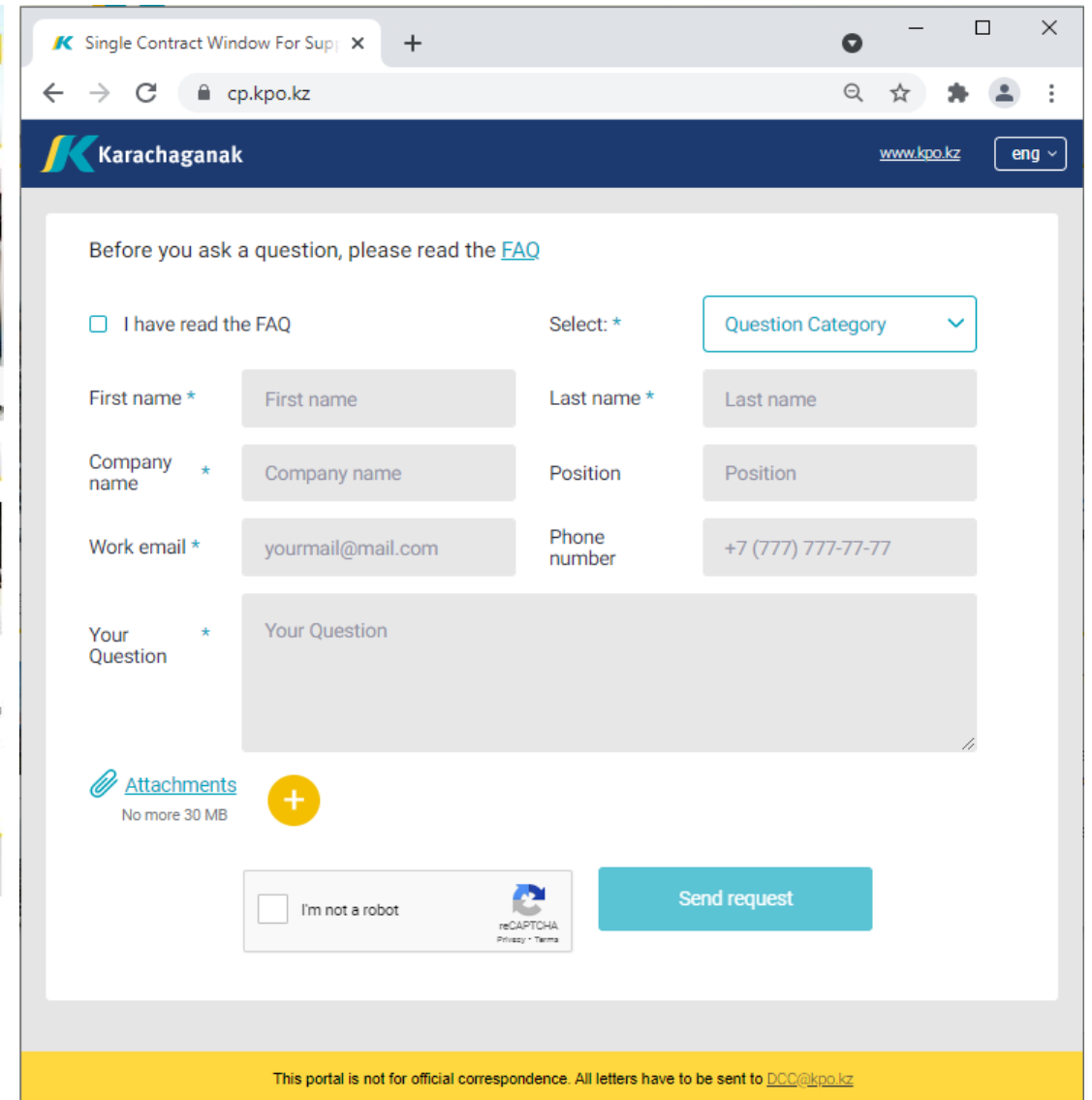
PROCESS



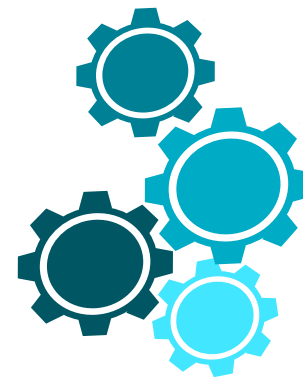
"SINGLE WINDOW" SYSTEM



The screenshot shows the Karachaganak website homepage. At the top, there is a navigation bar with the Karachaganak logo, language options (Kazakh, Russian, English), and a search bar. Below the navigation bar is a large banner image of two workers in red uniforms looking at a tablet, with the text "INVESTING IN FUTURE". The main content area is divided into three columns. The left column contains a "Company news" section with three articles. The middle column contains a "How to become a KPO vendor" section with a link to "Apply for a job" and a highlighted button that says "I am a supplier and I have a question for KPO". The right column contains a "Featured stories" section with a link to "Focusing on Environmental Stewardship". At the bottom, there is a footer with links to "About KPO", "Operations", "Sustainability", "News Room", and "Careers".



The screenshot shows the "Single Contract Window For Suppliers" form on the Karachaganak website. The form is titled "Before you ask a question, please read the [FAQ](#)". It includes a checkbox for "I have read the FAQ" and a "Select:" dropdown menu for "Question Category". The form also has input fields for "First name", "Last name", "Company name", "Position", "Work email", and "Phone number". A large text area is provided for "Your Question". Below the form, there is an "Attachments" section with a plus sign and the text "No more 30 MB". At the bottom, there is a reCAPTCHA checkbox for "I'm not a robot" and a "Send request" button. The footer of the form states: "This portal is not for official correspondence. All letters have to be sent to DCC@kpo.kz".

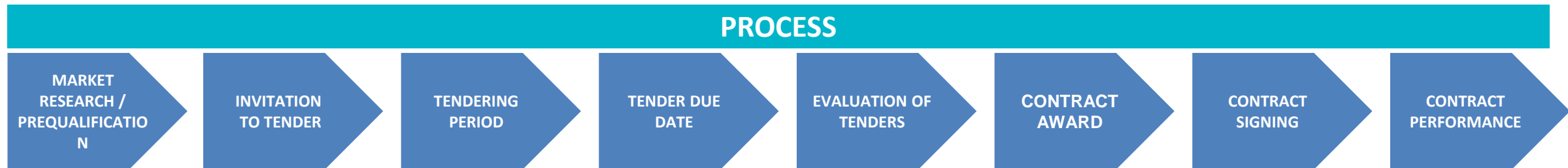


Procurement Process

PROCUREMENT PROCESS

KPO shall perform the procurement activities in accordance with:

- the Final Production Sharing Agreement (confidential and intended only for the use of KPO, its Shareholders and the Republic) and the Joint Operating Committee's Tender Procedures (JOC)
- current legislation
- approved budget and work program



MAXIMUM ATTENTION SHALL BE PAID TO



**TENDER PACKAGES
SUBMISSION
REQUIREMENTS**

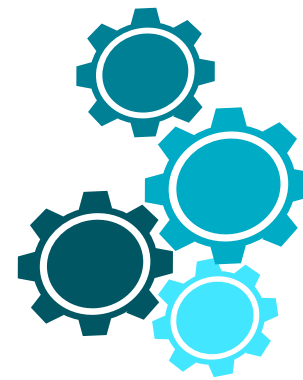
**TENDER PACKAGES
SUBMISSION
REQUIREMENTS THROUGH E-
BIDDING SYSTEM**
([Link to the instructions](#))

**INSTRUCTIONS
TO TENDERERS**

TENDER DUE DATE / TIME

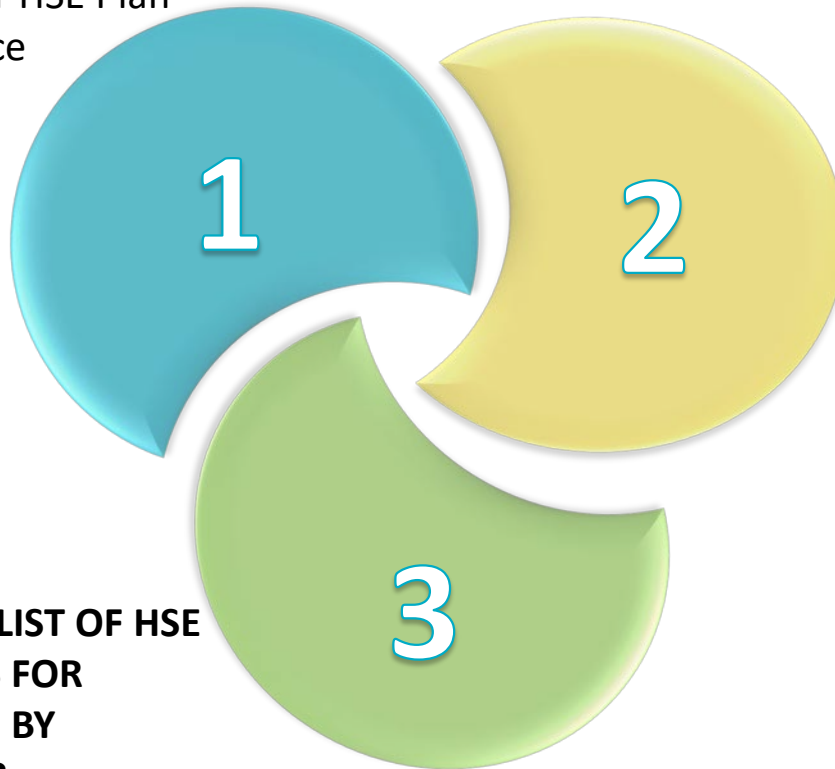
TENDER DOCUMENTATION CONTENTS

1. Cover letter
2. Forms, that shall be mandatorily signed, stamped and provided within timeframe specified:
 - Tender Acknowledgement and Confidentiality Agreement
 - Form of Tender
 - Certificate of Corporate Ownership and Declaration of Compliance
3. A package of documents related directly to the tender subject itself
4. Instructions to Tenderers
 - Form of Contract includes:
 - Form of Agreement
 - Schedule A – General Terms and Conditions
 - Schedule B – Scope of Goods/Services to be Supplied and Specifications
 - Schedule C – Compensation and Payment
 - Schedule D – Health, Safety and Environment (HSE) requirements
 - Schedule E – Special Conditions
 - Schedule F – Statement of Local Content
 - Schedule H – Industrial Relations
 - Questionnaire for Tender Participants
 - List of goods and technical delivery conditions (if applicable)
5. Instructions for preparing a tender proposal:
 - Instructions to Tender Participants
 - Bid marking template



KPO General HSE requirements

- Scope
- Contractor HSE Plan
- Compliance



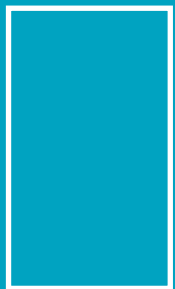
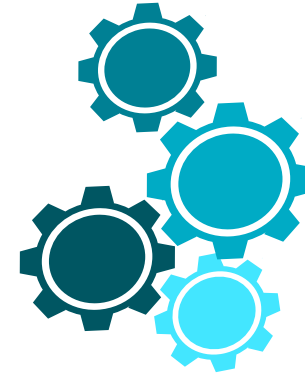
3 MINIMUM LIST OF HSE PROCEDURES FOR COMPLIANCE BY CONTRACTOR

2 EXECUTION OF THE CONTRACT

- ❖ Leadership and Commitment
- ❖ HSE policy
- ❖ Planning
 - *HSE Legislation*
 - *Risk Management*
- ❖ Support
 - *HSE Personnel*
 - *HSE Competence Requirements*
 - *HSE Training and Induction*
 - *HSE Communications*
 - *HSE Meetings*
 - *HSE Procedures*

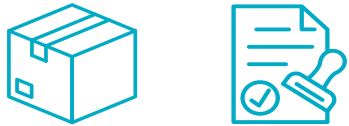
[illegible]

- ❖ Implementation
 - *Equipment Maintenance and Inspection*
 - *Occupational Health and Hygiene*
 - *Environment*
 - *Road Transport Safety*
 - *PPE Requirements*
 - *Emergency Response Interaction*
 - *Subcontractor management*
- ❖ Control and Monitoring
 - *HSE Observations and Reporting*
 - *Incident Investigation*
 - *HSE Audits and Inspections*
 - *Safety Reporting*
 - *Environmental Reporting*



Local Content Mechanisms

TRIAL ORDER



Tenders for testing a trial batch of GOODS from Kazakhstani suppliers

EARLY TENDER



Contract is concluded for the supply of GOODS with a suspensive condition or with a long-term delivery schedule

KAZAKH TENDER



Tenders exclusively among Kazakhstani Suppliers. The goal is to award contracts to Kazakhstani suppliers of GWS

CONTRACT IN **EXCHANGE** FOR INVESTMENTS (UNDER REVISION)



A contract in exchange for investment is a long-term contract concluded on a Single source basis, under which the supplier undertakes to produce goods of local origin that are the subject of a procurement contract in the territory of the Republic of Kazakhstan





Thank you!